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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/569,496	02/27/2006	Shlomo Magdassi	MAGDASSI 1A	3455
1444 7590 07/09/2008 BROWDY AND NEIMARK, P.L.L.C. 624 NINTH STREET, NW SUITE 300 WASHINGTON, DC 20001-5303			EXAMINER WIESE, NOAH S	
			ART UNIT 1793	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/569,496	Applicant(s) MAGDASSI ET AL.	
	Examiner NOAH S. WIESE	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>02/27/2006; 06/02/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Application

1. The claims 1-34 are pending and presented for the examination.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in this national stage application.

Information Disclosure Statement (IDS)

3. The information disclosure statements (IDS) were submitted on 02/27/2006 and 06/02/2008. The submissions are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner. Please refer to applicant's copy of the 1449 herewith.

Claim Objections

4. Claim 25 is objected to because of the following informalities: the claim references the "silica nanoparticles" of claim 22, on which claim 25 is dependent. However, claim 22 does not contain limitations regarding silica nanoparticles. The claim has been treated on merits as referring to an agent for decreasing the sintering temperature of the binding composition in general. Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1-8, 10, 15, and 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doyle et al (EP 1 223 201) in view of Hayakawa et al (US 5421877).

Regarding **claim 1**, Doyle et al teaches an ink for ink jet printing comprising a pigment, a fusible vitreous agent, and a carrier (see Abstract). The carrier is equivalent to the vehicle of instant claims. The fusible vitreous agent can be a glass powder frit (see paragraph 0038) and the pigment can be a ceramic oxide (see paragraphs 0007-0008). The frit and the ceramic particulate both have a particle size below 10 microns, and preferably below 5 microns (see paragraph 0009). The ink has a viscosity of between 10 and 25 centipoise, and because this ink is for ink jet printing, this would be the viscosity at jetting temperature (see paragraph 0020). Doyle teaches that the ink is fired at 700-1300°C to fuse the pigment to the substrate (see paragraph 0038).

While Doyle teaches that the particle size of the vitreous agent (frit) is less than 10 microns, it does not specifically teach a sub-micron size. However, it would have been obvious to one of ordinary skill to modify Doyle in view of Hayakawa et al in order

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to use these small particle sizes through routine optimization because Hayakawa teaches a coating composition comprising glass frit, ceramic pigment, and a vehicle wherein the glass frit and ceramic particles have submicron particle sizes (see claim 1 and example 1). Small particle sizes are used in the Hayakawa compositions because they lead to desired color in the pigment (see column 3, lines 35-40). One would have been motivated to use routine optimization and experimentation of the Doyle particle size ranges to arrive at frit and pigment particle size ranges below 0.55 microns because Hayakawa specifically teaches that these particle sizes are useful in a similar type of ink composition. One would have expected reasonable success in using the low end of the Doyle ranges because both Hayakawa and Doyle teach similar types of ink compositions. Therefore, claim 1 is obvious and not patentably distinct over the prior art of record.

Regarding **claims 2-6**, as discussed above, Hayakawa teaches that the metal oxide pigment particles can have sizes in the range of 0.1-1.5 microns and specifically 0.52 microns (see example 1). Further, because Doyle teaches that the ink is meant to be fired at a temperature of 700-1300°C, the ink would necessarily maintain its optical properties on exposure to temperatures in excess of 500°C.

Regarding **claim 7**, Doyle teaches that the pigment powder is a colored metal oxide, but does not specifically teach the compounds used. However, Hayakawa teaches that CuO or TiO₂ can be used as the pigment.

Regarding **claim 8**, Doyle teaches that the carrier can be an organic solvent (see Table 1).

Regarding **claim 10**, Doyle teaches that the ink can be printed on a glass substrate (see column 4, lines 8-11). As discussed above, Doyle teaches that the fusible vitreous particles can be a glass frit with small particle sizes, and the modification in view of Hayakawa teaches that these sizes can be submicron.

Regarding **claims 15 and 32-33**, Doyle teaches that the ink comprises a dispersant (see paragraph 0010).

8. Claims 9, 16, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doyle et al (EP 1 223 201) in view of Hayakawa et al (US 5421877) and Nyssen et al (US 6245138).

Regarding **claim 9**, while both Doyle and Hayakawa teach that the vehicle (carrier) used is an organic solvent, neither teaches that the vehicle can be one of those recited in claim 9. However, the solvent recited in claim 9 were known in the art at the time the invention was filed, and it would have been obvious to one to substitute one of these solvents for those taught by Doyle and Hayakawa.

Nyssen et al teaches a pigment preparation used in ink-jet printing wherein an organic solvent such as ethylene glycol monoalkyl or monomethyl ethers is included in the pigment composition (see column 9, lines 4-23). These organic solvents are used because they have high solubility in water, which is advantageous for water-based ink jet inks (see column 9, lines 1-4). This teaching shows that the organic solvents recited in claim 9 were known in the art to be advantageous in ink jet compositions. One of ordinary skill would have been motivated to use these solvents in the Doyle and Hayakawa compositions if one desired to prepare the compositions as a non-phase

change ink. One would have expected reasonable success in the modification because Doyle and Nyssen are both drawn to ink jet printing compositions. Therefore, claim 9 is obvious and not patentably distinct over the prior art of record.

Regarding **claim 16**, Nyssen et al teaches that a wetting agent can be used in the composition (see column 10, lines 56-62).

Regarding **claim 22**, while the Doyle and Hayakawa compositions do not contain aqueous vehicles, the Nyssen et al composition does. This shows that aqueous vehicles were useful in ink jet compositions, and thus claim 22 is obvious and not patentably distinct over the prior art of record.

9. Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doyle et al (EP 1 223 201) in view of Hayakawa et al (US 5421877) and Kniajer et al (US 6346493).

Regarding **claims 11-14**, the claims differ from Doyle in view of Hayakawa because the patents do not teach that the glass frit has a composition according to the claims. However, it would have been obvious to one of ordinary skill to modify Doyle in view of Kniajer et al because Kniajer teaches a lead-free glass frit composition. Kniajer teaches a glass frit composition comprising SiO_2 , Bi_2O_3 , and B_2O_3 . The ranges of the components encompass those of claims 12-14 such that one of ordinary skill could obtain many frit compositions from the teachings that meet the limitations of instant claims.

One of ordinary skill would have been motivated to use the frit composition taught by Kniajer et al in place of those taught by Doyle and Hayakawa because the

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Kniajer composition is lead-free, while the Doyle and Hayakawa compositions are not. Lead is known to be a seriously contaminant, and thus minimizing its use would be advantageous. One would have expected reasonable success in the modification because Doyle and Hayakawa call for a frit additive and Kniajer teaches a frit with good chemical resistance and weatherability properties. Therefore, claims 11-14 are obvious and not patentably distinct over the prior art of record.

10. Claims 17-18 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doyle et al (EP 1 223 201) in view of Hayakawa et al (US 5421877) and Aoki et al (US 5743946).

Regarding **claim 17**, neither Doyle nor Hayakawa teaches that a binder is included in the compositions. However, the use of organic polymeric binders in ink compositions was well known in the art at the time the invention was filed. Aoki et al teaches an ink composition comprising a fusible inorganic component, an aqueous medium (vehicle), and an organic binder (see Abstract), said ink being coated on a substrate by baking. One of ordinary skill in the art would have been motivated to employ the binder taught by Aoki in the Doyle composition because Aoki teaches that the binder provides properties advantageous to the printing use of the ink (see column 3, lines 17-26). One would have expected reasonable success in the modification because Doyle and Aoki are drawn to similar types of ink compositions. Therefore, claim 17 is obvious and not patentably distinct over the prior art of record.

Regarding **claims 18 and 34**, Aoki teaches that the binder can be a polyacrylate (see column 4, lines 55-58).

11. Claims 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doyle et al (EP 1 223 201) in view of Hayakawa et al (US 5421877) and Herrmann et al (US 6332943).

Regarding **claims 19-21**, neither Doyle nor Hayakawa teaches that the ink is a UV-curable-type ink, and thus the inks do not comprising UV-curable agents or photoinitiators or sensitizers. However, UV-curable inks were well known in the art at the time the invention was filed, and thus it would have been obvious to modify Doyle to comprise these elements.

Herrmann et al teaches a pigment preparation for ink jet printing comprising a pigment, an aqueous vehicle, and a dispersant (see claim 1). A UV-curable binder is used for affixing the print (see claim 4). The binder comprises a photoinitiator and a photo-polymerizable monomer (see column 8, lines 62-64 and column 17, lines 30-35). One of ordinary skill would have been motivated to use the UV-curable binder agent with the Doyle composition in order to cause the ink to be UV-curable. This would allow one to have fine control over the curing of the ink. One would have expected reasonable success in the modification because both Doyle and Herrmann are drawn to inks for ink jet printing. Therefore, claims 19-21 are obvious and not patentably distinct over the prior art of record.

12. Claims 23-24 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doyle et al (EP 1 223 201) in view of Hayakawa et al (US 5421877), Nyssen et al (US 6245138) and Morris et al (US 5269840).

Regarding **claim 23**, Doyle and Hayakawa teach that the fusible binding material is a glass frit, not a dispersion of silica nano-particles. However, the use of silica nano-particles in ink compositions was known in the art at the time the invention was filed. Morris et al teaches a colorant composition useful in inks that comprises metal oxide colorant and sol-derived grains (see claim 2). The sol-derived grains can be nano-sized silica (see claim 10). Using these nano-sized silica grains with an aqueous vehicle would entail using an aqueous dispersion of the silica nano-particles. One of ordinary skill would have been motivated to use the silica nano-particles with the oxide pigments taught by Hayakawa because Morris teaches that the silica nano-particles provide advantageous properties when used in ink applications (see column 2, lines 8-20). One would have expected reasonable success in the modification because Doyle teaches that a fusible binding material is used in the composition, and Morris teaches silica as a binding material, silica clearly being fusible. As such, claim 23 is obvious and not patentably distinct over the prior art of record.

Regarding **claims 24 and 29**, Nyssen teaches that the ink composition can comprise several types of organic polymers that are water dispersible (see column 8, lines 36-39).

Regarding **claim 30**, Nyssen teaches that acrylic emulsions can be added to the composition (see column 11, lines 41-44).

13. Claims 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doyle et al (EP 1 223 201) in view of Hayakawa et al (US 5421877), Nyssen et al (US 6245138) and Woolf (US 5897694).

Regarding **claim 25-28**, Doyle does not teach the use of a water soluble agent for decreasing sintering temperature. However, it would have been obvious to modify Doyle in view of Woolf because Woolf teaches an ink jet ink comprising an oxide pigment, a vehicle, and boric acid as a chelating agent (see claim 17). One of ordinary skill would have been motivated to include the boric acid taught by Woolf in the Doyle composition because Woolf teaches that the boric acid assists in the adhesion of the ink to the substrate (see Abstract). While this is a different purpose for including the boric acid than that of instant application, this addition would function in the same matter in both ink compositions because they comprise the same elements. Therefore, the limitations of claims 25-28 are met by the modification in view of Woolf, and the claims are obvious and not patentably distinct over the prior art of record.

14. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Doyle et al (EP 1 223 201) in view of Hayakawa et al (US 5421877), Morris et al (US 5269840), and Zhu et al (US 6251175).

Regarding **claim 31**, the claim differs from Doyle, Hayakawa, and Morris as applied above because the applied prior art does not teach that the binder is a colloidal system. However, such binder systems were known in the art at the time the invention was filed for their use in ink jet compositions. Zhu et al teaches an ink jet composition comprising a solvent, a colorant, and a resin binder (see claim 1). The binder can be used as a colloidal system (see column 4, lines 14-21). Zhu further teaches that the ink vehicle can be aqueous (see column 1, lines 46-52). One would have been motivated to use a colloidal organic polymer binder taught by Zhu in the composition taught by Doyle

because Zhu teaches that the binder serves to provide a rapid dry time, which would be advantageous to printing applications (see column 4, lines 10-13). One would have expected reasonable success in the modification because Doyle and Zhu are drawn to ink jet compositions. Therefore, claim 31 is obvious and not patentably distinct over the prior art of record.

Conclusion

15. No claim is allowed.

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Noah S. Wiese whose telephone number is 571-270-3596. The examiner can normally be reached on Monday-Friday, 7:30am-5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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/Jerry A Lorengo/
Supervisory Patent Examiner, Art Unit 1793

Noah Wiese
June 30th, 2008
AU 1793